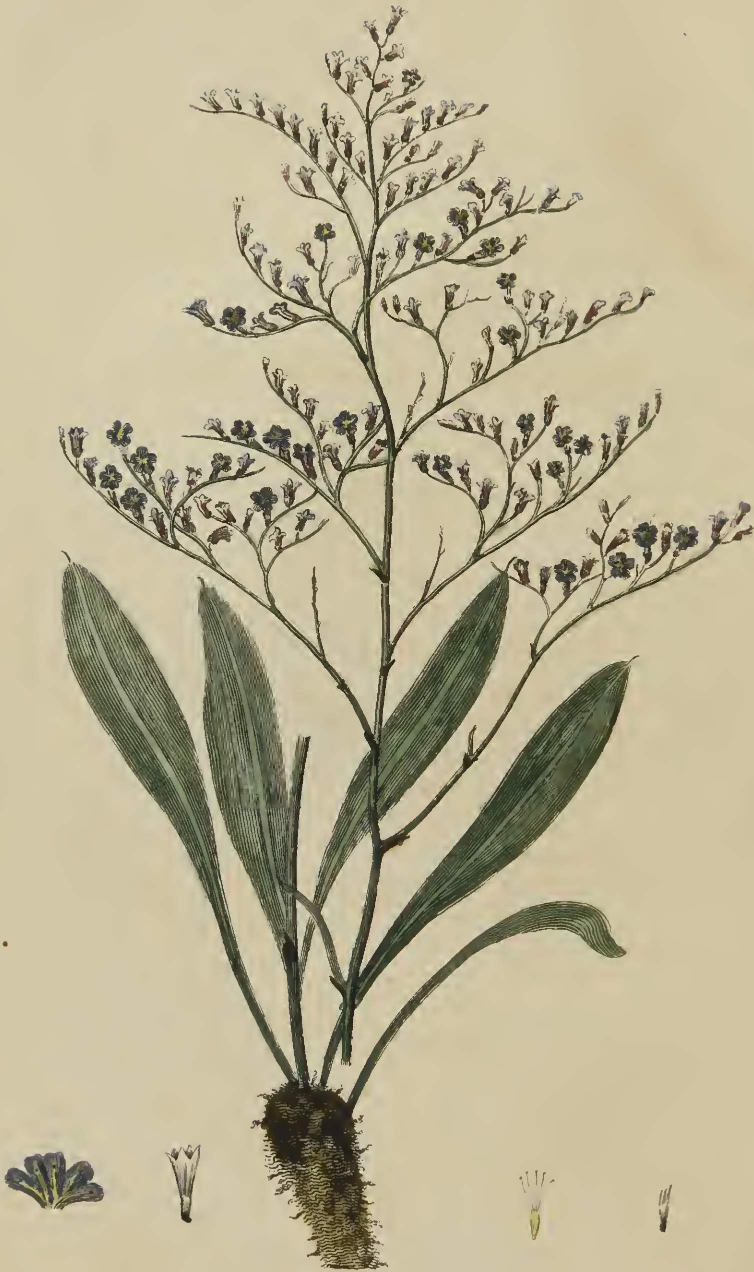

Statice Limonium

AN

EXPERIMENTAL INQUIRY

INTO THE

CHEMICAL AND MEDICAL PROPERTIES

OF THE

STATICE LIMONIUM

OF

LINNÆUS.

BY VALENTINE MOTT,

CITIZEN OF THE STATE OF NEW-YORK, AND PRESIDENT
OF THE AMERICAN ÆSCULAPIAN SOCIETY.

At tibi prima, puer, nullo munuscula cultu,
Errantes hederas passim cum baccare tellus,
Mixtaque ridenti colocasia fundet acantho.

VIRG. BUCOL. ECLOG.

NEW-YORK:

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1806.

AN

INAUGURAL DISSERTATION,

SUBMITTED TO THE PUBLIC EXAMINATION

OF THE

FACULTY OF PHYSIC

UNDER THE AUTHORITY OF THE TRUSTEES OF COLUMBIA COLLEGE, IN THE STATE OF NEW-YORK,

BENJAMIN MOORE, D. D. President;

FOR THE DEGREE OF

DOCTOR OF MEDICINE,

On the 11th Day of the 11th Month (November) 1806.

TO

DR. HENRY MOTT,

THIS

INAUGURAL THESIS

IS MOST RESPECTFULLY DEDICATED,

AS

A TRIBUTE

OF

FILIAL GRATITUDE, AFFECTION, AND ESTEEM,

BY

THE AUTHOR.

TO

VALENTINE SEAMAN, M. D.

AND ONE OF THE SURGEONS OF THE NEW-YORK HOSPITAL,

THE FOLLOWING PAGES

ARE

INSCRIBED

AS

A TESTIMONY OF ESTEEM AND RESPECT,

BY HIS

Affectionate Friend

And Pupil,

THE AUTHOR.

TO

DAVID HOSACK, M. D.

Professor of Botany and Materia Medica in Columbia College;
Fellow of the Linnæan Society of London, and of the
Royal Medical and Physical Societies of
Edinburgh, &c. &c.

THIS DISSERTATION

IS INSCRIBED

By his obliged Friend,

THE AUTHOR.

INTRODUCTION.

IT is the duty of every enlightened citizen to examine into the natural productions of his own country. From the vegetable world we derive many articles which are tributary to our existence, both as food and remedies in diseases. It must animate every member of this republic, to see the increasing industry of his countrymen, in exploring that vast extent of luxuriant territory, which has only been trodden by the savages of the wilderness; and to contemplate how replete it is with promising advantages, must fill the mind with the most pleasing enthusiasm, surpassing all adequate estimation. In proportion as ingenuity or accident shall give rise to useful discoveries in this department of nature, it is probable our happiness will increase.

No doubt many plants inhabit the wilds of this western world; some of which possess very valuable alimentary properties; and others which, by their medicinal virtues, are capable

of obviating many of our present incurable diseases. The variety of soils and climates which it comprehends, encourage the belief that more remain to be discovered, and that the Materia Medica may still be enriched with many valuable articles from the continent of America, whose virtues were before unnoticed or unknown. To be able to examine with accuracy this interesting subject, the Science of Botany, or that branch of Natural History which teaches the right knowledge of vegetables, and their application to the most beneficial uses, is an object which not only merits the attention and encouragement of every patriotic and liberal mind, but undoubtedly deserves a place amongst the first of useful pursuits.

If it be true that the diseases of the United States are different in their nature and character from those of the other parts of the world, they necessarily call for a different mode of treatment. Dr. Caldwell, of Philadelphia, observes, " But it is not only by a difference in the character, form, and violence of her diseases, that the United States is distinguished from the countries of Europe. She is, perhaps, no less distinguished by the

peculiarities of her native remedies. Though we do not mean to assert that such is the balance between physical good and evil, that diseases and their antidotes uniformly spring from the same soil, yet perhaps the sentiment ought not to be too hastily rejected. It is unquestionably true, that certain countries remarkable for their diseases, have enriched the Materia Medica with some of its choicest articles. Be this as it may, we have seen enough to convince us, that in a medical point of view, the bosom of our country has not been so bounteously peopled with vegetables to no purpose. The plants of the new world possess balsamic and healing virtues no less active, and in no less abundance than those of the old. But as yet these virtues have not been so completely developed, nor their form and mode of exhibition in medicine so accurately ascertained. It is still in the fields and forests of the western hemisphere, that the lines of the poet are most emphatically realized :"*

"Full many a flower is born to blush unseen,
"And waste its virtues on the desert air."

* Preliminary Discourse.

America has already furnished the world with many valuable remedies; she has afforded us a medicine, the ipecacuanha, which the great and venerable Sydenham, that meteor of the eastern world, long lamented the want of, though he had many very valuable emetics. Besides this, the cinchona, the quassia, the Seneka and Virginia snake roots, the Carolina pink root, and the stramonium, are but a very small part of the medicinal productions of America. It behoves us to examine with the most assiduous attention, the indigenous productions of our own country, and to explore the untrodden fields and forests; for I verily believe there is no quarter of the globe which promises more than this, to confirm and verify the opinion early held in medicine, that every country possessed an antidote to its diseases.

To behold the fatal effects of consumption upon thousands of the fairest of all sublunary beings, without being able to administer much ease or comfort, must deeply wound the tenderest feelings of every truly philanthropic Physician, and humble his towering pride to that of only a spectator of human misery. We have already learnt much, but

we have yet much to learn. Perhaps some of the sons of Columbia may be fortunate enough to discover a bark, which will be as infallible in the cure of consumption, as the Peruvian bark in intermittents, or mercury in syphilis. Who knows but on the banks of the Missisippi, there may bloom a flower whose medicinal qualities may prove an antidote to the cancer or hydrophobia? "Who knows but what at the foot of the Alleghany Mountain there blooms a flower that is an infallible cure for the epilepsy? Perhaps on the Monongahela, or the Potowmac, there may grow a root that shall supply, by its tonic powers, the invigorating effects of the savage or military life in the cure of consumptions."*

When we contemplate the rapid progress of medical science in this western hemisphere, and behold the indefatigable industry of its illustrious advocates, we are led with pleasure to believe, that the æra is not very far distant, when those paralized limbs which fill the avenues and wards of our hospitals, will find quick and permanent relief; and

* Dr. Rush.

when perhaps we may be able to eradicate from the system the tedious scrophula, and quell the boisterous and tempestuous mind of the maniac.

Influenced by these considerations, I have bestowed some time to the examination of one of our own indigenous vegetables. The experiments which I have related may be relied on as being accurate, as every circumstance which could in the least degree have any effect was strictly attended to; and though there be an apparent sameness in several of them, still I deem them all necessary, as corroborative of each other. Concerning the observations or theory which I have deduced from them, I must observe, with the learned and ingenious Burke, that "every theory founded on experiment, and not assumed, is always good for as much as it will explain." In recommending its use in diseases, I flatter myself I have not dealt in hyperbole.

AN

INAUGURAL DISSERTATION

ON THE

STATICE LIMONIUM.

THE Statice Limonium belongs to the class Pentandria, and order Pentagynia of the sexual system of Linnæus, and is described in the following manner in the Genera Plantarum:

Cal. Perianthium commune diversæ in diversis structuræ.

Perianthium proprium monophyllum infundibuliforme.

Tubo angustato, Limbo integro, plicato, scarioso.

Cor. Infundibuliformis, Petala quinque, basi coalita, inferne angustata, superna latiora, obtusa, patentia.

Stam. Filamenta quinque, subulata, corolla breviora, unguibus corollæ inserta, Antheræ incumbentes.

Pist. Germen minutissimum. Styli quinque, filiformes, distantes, Stigmata acuta.

Per. Capsula oblonga, teretiuscula, membranacea, quinque cuspidata, unilocularis, evalvis.

Sem. Unicum, oblongum, e longo funiculo pendulum.

Dr. Jussieu, in his learned and ingenious work, entitled, *Genera Plantarum secundum ordines naturales disposita*, has placed the Statice in the seventh class of Plantæ dicotyledones apetalæ, and fourth order Plumbagines.

The Statice Limonium is a native of Europe and America. In Europe it is known by the name of Sea Lavender, and in this country it generally goes by the name of Marsh Rosemary.

In Europe it was gathered by Lord Viscount Lewisham, in August, on Woldam Marsh, near Rochester, and presented to Dr. Smith, author of the English Botany. He observes, that the plant loves a muddy soil in salt marshes, or on the shores of great rivers washed by the tide, and flowers late. Scarcely any vegetable is more various as to luxuriance, being sometimes found with leaves scarcely an inch long, and not more than six or eight flowers in the pannicle, while at other times it is even much more large, and its flowers more abundant. The bright blue colour distinguishes it at a distance, and that colour is tolerably permanent. Though less magnificent than some foreign species of its genus, this is a very beautiful plant. Its appearance scarcely enough resembles lavender to justify the English name, nor has it any aromatic quality. The root is strong and perennial.*

In this country too it grows in salt marshes and along the shores of rivers washed by the tide. It is found in great abundance in the salt marshes in the vicinity of the city, and different parts of the State of New-York: it

* See Dr. Smith's English Botany, vol. ii. p. 102.

flowers about the latter end of the month of July and first of August: at this season the leaves are from three to four inches in length. This is a perennial plant, and it has a fusiform root. The pannicle sometimes rises to the height of twelve or twenty inches; in many instances it does not exceed eight or ten inches, and is very beautifully ornamented with small blue flowers. These observations relative to the first appearance, duration, and flowering of the plant, will apply to the neighbourhood of New-York.

The root of this plant has long been a celebrated domestic remedy in dysentery and diarrhœa, and within a few years has been introduced into practice;* but as the medicinal properties of it have not been accurately investigated, I subjected it to the following experiments.

* I have, with a great deal of pleasure, observed, in a work written several centuries ago, by John Bauhin, entitled, *Historiæ Universalis Plantarum*, the following remarks concerning the Limonium, which evince the great attention our predecessors paid to the medicinal properties of plants: "Limonium (λειμώνιον) aliis Neurodes dictum, folia habet Betæ, verum tenuiora, & minora (vulg. longiora) decem aut plura; caulem tenuem, rectum, Lilio æqualem, rubro semine refertum, quod gustu astringit. Semen tritum & ex vino acetabuli mensura potum, dysentericis, cœliacisque prodest, ac rubentem fæminarum fluorem cohibet. Nascitur in pratis & palustribus, authore Dioscoride. Plinius Betam siluestrem vocari tradit. Est & Beta siluestris (inquit lib. xxi. cap. 8) quam Limonium vocant, alii Neurodes, multó minoribus, tenuioribusque ac densioribus foliis, undecim sepé caulium. Huius folia ambustis utilia, guttantia astringunt. Semen acetabuli mensura dysentericis prodest. Aquâ & é radice cocta, maculas vestium elui dicunt, itemque membranarum." In another place he observes, "Limonij semé quod austerum est, inquit Galenus, cum vino dant cœliacis, & dysentericis, & hæmoptoicis. Prodest etiam ad fluxum muliebrem. Satis autem est dare acetabuli mensura." *Vide Tomus iii. p.* 540.

EXPERIMENT I.

One drachm of the dried root coarsely pulverized, was infused twenty-four hours in three ounces of cold spring water; the clear liquor was then filtred, it was of a pale red colour, of a sweetish and somewhat astringent taste. Litmus paper dipped in it immediately assumed a red colour: a solution of sulphate of iron* changed it to a black colour: a solution of oxy-muriat of mercury produced a light yellow turbidness, which was soon followed by a yellow precipitate: a solution of acetite of lead produced a milky turbidness, and the precipitate which followed was very copious, and of a white colour.

EXPERIMENT II.

Two ounces of the filtred infusion, as used in the preceding experiment, were put into a retort, and a gentle heat applied for the space of an hour by means of a lamp; the fluid which came over into the receiver was almost colourless, and of a disagreeable smell and taste. Litmus paper immersed in it became of a pale red. Two drachms of it were mixed with half a drachm of the solution of sulphate of iron; the colour of it was changed to a light purple, and in a few minutes a dirty brown precipitate

* It may not be improper to mention that this solution, and the two succeeding solutions of the oxy-muriat of mercury and acetite of lead were made by dissolving fifteen grains in an ounce of water. And this is the strength of each employed in the following experiments.

fell to the bottom of the vessel. The solution of acetite of lead produced a milkiness, though in a less degree than in the first experiment. The solution of oxy-muriat of mercury had no effect upon it, nor had a saturated solution of the carbonate of pot-ash.

EXPERIMENT III.

The residuum which remained in the retort after distillation was of a dark brown colour, of the consistence of syrup, and of a saltish taste. It was dissolved in water and filtred. On immersing a piece of litmus paper in it, a red colour immediately ensued: the solution of sulphate of iron struck a deep black. A solution of nitrate of silver in water was added to it, and instantly a white curdy precipitate took place.

EXPERIMENT IV.

After filtration in the last experiment, there remained on the filtre a blackish powder, which was dissolved in spirits of wine. Upon adding a solution of carbonate of pot-ash, a brown precipitate soon took place; the clear liquor was then decanted, and sulphate of iron struck a dark purple colour; the solution of nitrate of silver a milky colour, followed by a white precipitate.

EXPERIMENT V.

Three ounces of boiling spring water were poured upon one drachm of the dried root finely divided: having been infused twenty-four hours, it was filtred. The colour was paler than in the first experiment, but its sensible properties were nearly the same. Litmus paper was changed to a light red: the solution of sulphate of iron produced a dark purple colour: the oxy-muriat of mercury a light yellow turbidness: the solution of carbonate of pot-ash changed it to an olive colour.

EXPERIMENT VI.

Into a glass retort was put an ounce and a half of the filtred infusion of the last experiment, and a gentle heat applied for the space of an hour. The fluid which came over into the receiver was transparent and almost insipid to the taste. It did not change the colour of litmus paper, nor had the solution of oxy-muriat of mercury any effect upon it. Three drachms were mixed with half a drachm of the solution of sulphate of iron, and but a very faint purple colour took place.

EXPERIMENT VII.

The residuum which remained in the retort after distillation in the last experiment was dissolved in water; the solution of nitrate of silver produced a copious curdled

precipitate: upon adding a few drops of sulphuric acid, a slight effervescence took place.

EXPERIMENT VIII.

One drachm of the dried root, divided into small pieces, was triturated for fifteen minutes in three ounces of cold spring-water; it was then set aside to infuse. After having infused twenty-four hours, it was filtred; the filtred fluid was less transparent than the preceding infusions, and possessed a more disagreeable taste. It changed litmus paper to a light red. The solution of sulphate of iron caused a dark purple colour: the solution of oxy-muriat of mercury a yellowish turbidness, followed by a copious orange coloured precipitate; and the solution of acetite of lead a white precipitate.

EXPERIMENT IX.

Two wine glasses were taken, into each was put a drachm of the cold triturated infusion of the eighth experiment, diluted with an equal quantity of pure spring-water. Into one was dropped twelve drops of the solution of nitrate of silver, and there immediately took place a white cheesy precipitate: to the other was added twelve drops of a solution of mercury in nitric acid, and a white granulated precipitate soon fell to the bottom.

EXPERIMENT X.

One ounce and a half of the filtred infusion of experiment the eighth, was distilled in a retort for an hour and a half with a gentle heat. The fluid in the receiver was of a pleasant aromatic odour, and transparent; it changed the colour of litmus paper to a very pale red; produced a very faint purple colour when mixed with the solution of sulphate of iron; it was not changed upon adding the solution of oxy-muriat of mercury; with the acetite of lead a white colour took place, which was soon followed by a white precipitate.

EXPERIMENT XI.

The residuum in the retort after distillation in the last experiment was evaporated to a dry mass by an increased heat; the mass was of a black colour, and emitted a disagreeable smell, like vegetable extract. It had a caustic alkaline taste, and effervesced when sulphuric acid was dropped upon it.

EXPERIMENT XII.

About four grains of the dry residuum of experiment eleventh, was dissolved in two drachms of spirits of wine. The solution of nitrate of silver was added, and it caused an immediate white curdled precipitate; after

standing a little while the clear supernatant liquor was decanted, and it turned litmus paper to a pale green.

EXPERIMENT XIII.

After one drachm of the dried root, coarsely pulverized, and triturated with three ounces of hot water, had infused twenty-four hours, it was filtred. The colour of the filtred liquor was nearly the same as the preceding preparations, but its sensible properties were considerably stronger. It changed litmus paper, and an infusion of the petals of blue lark-spur,* to a bright red. With the solution of sulphate of iron it struck a dark purple; with oxy-muriat of mercury a beautiful orange colour; and with the solution of acetite of lead it immediately produced a pale white precipitate: a solution of sulphate of copper produced a dirty brown curdled precipitate; and the solution of nitrate of silver a white curdled turbidness.

EXPERIMENT XIV.

Two ounces of the above filtred infusion were distilled in a retort for an hour; the fluid which came over in the receiver possessed stronger sensible properties than the distilled fluid of any of the previous preparations. It struck a deeper purple with the solution of sulphate of iron: it was changed to an orange colour by the oxy-

* Delphinium Staphisagria.

muriat of mercury; with the acetite of lead it became milky; and with the nitrate of silver it produced a cheesy precipitate. The dark-coloured residuum in the retort effervesced when muriatic acid was dropped upon it: dissolved in water it changed litmus paper to a pale green; and upon adding the solution of nitrate of mercury a white precipitate took place.

EXPERIMENT XV.

Four wine glasses were taken, each containing an ounce of pure spring-water, and one grain of sulphate of iron in solution; into one glass was put a drachm of the cold infusion; into another one drachm of the hot infusion; into a third one drachm of the cold triturated infusion; and into the fourth one drachm of the hot triturated infusion: the colour of the water in all the glasses was changed to a dark purple colour; but the glass containing the simple cold infusion was considerably the darkest, approaching very nearly to the colour of ink. The hot triturated infusion was the next darkest colour. I may likewise observe, that the cold infusion is the most elegant and pleasant preparation; the hot infusion, and triturated infusions, hold in suspension some of the finely divided root, which is not entirely separated by filtration or cooling.

EXPERIMENT XVI.

One drop of a cold infusion of one drachm of the dried root in three ounces of water was dropped into two ounces of water, in which one grain of sulphate of iron was dissolved, and it produced a slight purplish discolouration.

EXPERIMENT XVII.

One drachm of the dried root was boiled for fifteen minutes in four ounces of spring-water down to three; it was then filtred; the colour of it resembled claret or port wine; it possessed an astringent and somewhat bitter taste. With the solution of sulphate of iron it struck an inky colour; the solution of oxy-muriat of mercury a yellowish; the acetite of lead a whitish; the sulphate of copper a brown; and sulphure of alkali caused a light white colour. It changed litmus paper to a red.

EXPERIMENT XVIII.

The filtred decoction distilled in a retort afforded a fluid in the receiver, which changed litmus paper to a very faint red; produced a pale purple with the solution of sulphate of iron; with the oxy-muriat of mercury a light yellowish turbidness; and with the acetite of lead a whitish turbidness.

EXPERIMENT XIX.

The residuum in the retort after distillation effervesced when nitric acid was added to it; and upon dissolving it in water, and dropping a solution of nitrate of silver in it, a white cheesy precipitate took place.

EXPERIMENT XX.

To determine the comparative astringency of the cold infusion and decoction, I took two wine glasses, each containing an ounce of water, in which was dissolved two grains of sulphate of iron; the dark purple colour which ensued upon adding a drachm of the cold infusion to one, and a drachm of the decoction to the other, was very similar in both.

EXPERIMENT XXI.

One drachm of the dried root was infused for twenty-four hours in three ounces of spirits of wine; the clear liquor was then decanted. It struck an inky blackness with the solution of sulphate of iron; with the oxy-muriat of mercury it produced an orange colour; with the solution of acetite of lead a white, which was soon followed by a copious precipitate. Litmus paper was changed to a bright red.

EXPERIMENT XXII.

Upon adding one drop of a solution of nitrate of silver to a drachm of the tincture, and one drop of a solution of quicksilver in nitric acid to another drachm, a white cheesy precipitate took place in each.

EXPERIMENT XXIII.

After a drachm of the cold infusion had been added to a chalybeate solution, and a black precipitate taken place, the clear supernatant liquor was decanted; the solution of sulphate of iron had no effect upon it; it changed litmus paper to a bright red: an infusion of oak galls changed it to a purple colour: lime-water caused a precipitate: a solution of carbonate of pot-ash produced a slight effervesence, followed by a copious precipitate.

EXPERIMENT XXIV.

To a strong filtred infusion of the dried root a small quantity of a solution of carbonate of pot-ash was added; a copious yellowish precipitation soon took place; the addition of pot-ash was continued till no more precipitation ensued: after standing some little time the supernatant liquor was poured off; and sulphuric acid added to the precipitate, by which it was immediately dissolved.

EXPERIMENT XXV.

To the supernatant liquor of the twenty-fourth experiment the solution of sulphate of iron was added, and it produced a very pale purple colour; the solution of oxymuriat of mercury caused a light yellowish precipitate.

EXPERIMENT XXVI.

Four drachms of the dried leaves were infused twenty-four hours in half a pint of pure rain-water; the clear liquor was then poured off; sulphate of iron and oxymuriat of mercury had no effect upon it; nor did it change the colour of litmus paper. But when nitrate of silver, and nitrate of mercury were added, a white curdled precipitate took place.

I evaporated eight ounces of the clear liquor by means of a gentle heat continued several hours, to the quantity of an ounce; it was then set aside to cool, and in the course of two or three days I obtained a beautiful arrangement of regular cubical crystals.

Lest it should be said by some, that the precipitates which have been mentioned, as following the addition of nitrate of silver and mercury to the different preparations, were owing to the roots not being thoroughly cleaned of the dirt of their native soil, I made the following experiment.

EXPERIMENT XXVII.

Having completely removed the external part of the dried root, I took half a drachm of the central part, cut into small pieces, and infused it twenty-four hours in an ounce of pure rain-water; the clear liquor was then decanted; on adding nitrate of silver a white caseous precipitate was produced, and nitrate of mercury caused a copious yellowish granulated precipitate.

EXPERIMENT XXVIII.

If to half an ounce of the cold infusion of the dried root, one drop of the solution of sulphate of iron is added, it immediately assumes a black colour; but if one drop of sulphuric acid is added, the black colour is instantly removed; add a solution of carbonate of pot-ash till the sulphuric acid is neutralized, and the blackish discolouration returns. This experiment I repeated with the same effect with a cold infusion of galls.

EXPERIMENT XXIX.

To determine the relative quantity of gallic acid contained in the cold infusion and tincture, I took two drachms of each, prepared with an equal quantity of the dried root, and put into two separate wine glasses, and added to each glass a scruple of sulphate of iron. Characters written with the cold infusion were of a very

dark brown colour, while such as were written with the tincture were as black as characters written with common ink.

EXPERIMENT XXX.

To determine the relative quantity of gallic acid contained in the root of the Statice Limonium and in galls, I infused one drachm of the dried root in two ounces of cold water, the same quantity in two ounces of spirits of wine, and the same quantity of galls in two ounces of cold water. To equal quantities of each was added a scruple of sulphate of iron. Characters written with the infusion of the root were, as in the twenty-ninth experiment, considerably paler than those written with the tincture; while between such as were written with the infusion of the root, and of galls, the difference was almost imperceptible.

After observing the blackness in the preceding experiments, I concluded that by a proper proportion of the root of the Statice Limonium, sulphate of iron and gum arabic, an ink might be made equal to any at present in use, and for which purpose the following experiments were instituted.

EXPERIMENT XXXI.

My first trial was with the cold infusion of the dried root: six drachms of this, one drachm of sulphate of iron, and half a drachm of the mucilage of gum arabic

were taken and accurately mixed together. The ink which I obtained in this manner was nearly equal to our ordinary writing ink.

EXPERIMENT XXXII.

Six drachms of the tincture, and one drachm of sulphate of iron were put together; it afforded an ink considerably blacker than that commonly in use.* The ink made with the tincture of the Statice Limonium always spreads more or less when first made; it however looses this bad quality in the course of two or three days.

EXPERIMENT XXXIII.

To determine more accurately the degree of blackness of the ink in the two preceding experiments, I made a relative trial with exactly the same quantity of galls. The blackness of characters written with the tincture of the Statice Limonium was much greater than those with an infusion of galls; while between those written with galls and the infusion of the Statice there was but very little difference.

EXPERIMENT XXXIV.

In order to ascertain the comparative astringency of the dried and green roots, I took equal quantities in bulk of

* The gum arabic was not added to this, as it is well known to be insoluble in spirituous menstrua.

each, and infused separately in an ounce of pure spring-water for twenty-four hours. Equal portions of each were taken; to each was added an equal quantity of the solution of sulphate of iron: the infusion of the dried root was changed to a very dark purple, while in that of the green root only a very faint purplish discolouration took place. This experiment I repeated several times, and with the same result.

EXPERIMENT XXXV.

A considerable quantity of the dried root was burnt to ashes in a crucible; the ashes were then lixivated with pure rain-water; after standing twenty-four hours the lixivium was decanted. Litmus paper dipped in it soon assumed a green colour; sulphuric acid dropped in it caused a slight effervescence; sulphate of iron had no effect upon it, nor had the tincture of galls. Nitrate of silver, and nitrate of mercury, both caused a white curdled precipitate. A solution of tartareous acid in water was added to a portion of it, but no precipitate ensued.

Six ounces of the above lixivium were evaporated by means of a gentle heat for several hours, till it was reduced to one; it was then set aside in a flat bottomed vessel, and after having stood a few hours the bottom was thickly covered with regular cubic crystals.

OBSERVATIONS

ON THE

EXPERIMENTS.

By the first experiment we learn that the simple cold infusion extracts the virtues of the root in a considerable degree, as is evidenced by the re-agents there mentioned. That the gallic acid is obtained in this manner, is very evident from the infusion converting vegetable blues to a red, and decomposing several metallic salts, and precipitating their bases. From the second it appears that the gallic acid rises in the process of distillation, and is manifested by litmus paper and sulphate of iron, though but in a very trifling degree.

The third and fourth experiments afford us the astringent principle in the retort after distillation in a very concentrated state, as is proven by the tests of vegetable blues and sulphate of iron. They likewise convince us by the taste and nitrate of silver that a muriatic salt exists in them.

The fifth, eighth, and thirteenth experiments were made with a view of ascertaining the comparative strength of the simple hot infusion, cold triturated, and hot triturated infusions. From them it appears that a very important practical fact may be deduced; which is, that the

sensible properties were very nearly the same in each; and the tests made use of likewise evince nearly the same similarity of strength. The sixth, tenth, and fourteenth experiments show that the gallic acid comes over into the receiver in a separate and uncombined state, as appears evident from litmus paper being changed to a pale red.

The object of the eleventh experiment was to ascertain whether there did not exist an uncombined alkali in the residuum of experiment tenth, which is proven by the strong caustic alkaline taste, and the effervescence which instantly ensued upon dropping a few drops of sulphuric acid upon it.

Experiment twelfth, and the residuum in the retort, after distillation in experiment fourteenth, corroborate the eleventh, that an uncombined alkali and muriatic salt exist in the residua. In experiment twelfth the residuum was dissolved in spirits of wine; nitrate of silver produced a white curdled precipitate; after the precipitation had taken place, the supernatant liquor changed litmus paper to a green. The muriatic acid which was manifested by the nitrate of silver could not have remained in solution with an alkali without uniting with it; as it is well known that the attraction between acids and alkalies is such that they cannot remain together without uniting.

When nitrate of silver is added, a double decomposition and combination takes place; the muriatic acid unites with the silver and falls insoluble to the bottom; the nitric acid unites with the alkali of the muriatic salt, or the separate and uncombined alkali, and forms a neutral salt,

which is held in solution in the supernatant liquor, together with the uncombined alkali.*

In experiment ninth it is clearly shown that in the cold triturated infusion a muriatic salt exists by the tests of nitrate of silver and nitrate of mercury. I say muriatic salt, because, in an experiment hereafter to be noticed, I have proved, that the mineral acids destroy the property in astringent vegetable infusions of stricking a black colour with sulphate of iron.

The fifteenth experiment determines a point of no small importance in practice. In this experiment I have shown which of the several preparations of the root, for the purpose of obtaining the astringent principle, is to be preferred. These trials for ascertaining the astringency of the different preparations were made with the greatest caution; and it appears from the experiment, that the simple cold infusion struck the darkest black with sulphate of iron; and in a former experiment it is observed, that the sensible properties of the cold infusion were considerably the strongest. That it should be the most elegant and pleasant preparation is very easy to be conceived; the hot infusion, and especially the triturated infusions, must always suspend more or less of the finely divided root, which will render them disagreeable and unpleasant.

* If I had ascertained the neutral salt, by evaporating and crystalizing the supernatant liquor, to be nitrate of soda, or cubic nitre, then there could remain no doubt of the species of uncombined alkali being the mineral or soda, as the affinity between the vegetable alkali and acids is greater than the mineral alkali or soda; but this I omitted owing to the small quantity I used.

From the sixteenth experiment we find that the simple cold infusion may be used as a nice test of iron in mineral waters; and in the seventeenth experiment, that in the process of boiling the more volatile parts will escape, and the preparation be deprived of the aromatic quality. In this experiment the astringent principle is obtained from the root by decoction, as is manifested by the same tests as before mentioned: and in experiment eighteenth the astringent principle exists in the receiver after subjecting the decoction to the process of distillation.

The hot menstruum suspending more of the fine powder than the cold, will account for the generally received opinion that heat increases the solvent power of water on vegetables in general; and in so considerable a degree upon the Peruvian bark, that Dr. Skeete estimated the specific gravity of the decoction to be to that of the infusion as five to two. Dr. Percival, in his valuable experiments on the Peruvian bark, observes, "that the cortex yields its virtues at least as perfectly to cold as to boiling water; and the simple infusion hath certainly many advantages over the decoction. It is a much more agreeable and elegant preparation, and the principles of the bark remain perfectly unaltered in it, retaining the same proportions to each other as in the substance of the drug itself." *

From experiment nineteenth it appears that a muriatic salt and uncombined alkali is shown to exist in the retort after distilling the decoction, which was mentioned in ex-

* Vide his Essays, vol. i. p. 45.

periments eleventh and twelfth. In experiment twentieth my object was to find out the difference of astringency between the cold infusion and decoction; and from it we learn, that the black colour which ensued upon adding to them sulphate of iron was very similar in both.

The twenty-first experiment proves the superior solubility of the root in spirituous menstrua, by the inky blackness which was produced with sulphate of iron, and the bright red colour which litmus paper assumed.* After macerating the same quantity of the root several different times in water, and the infusion each time evincing the astringent principle in a greater or lesser degree, I have, by infusing the same quantity in a spirituous menstruum obtained a greater proportion of the astringent principle, as shown by the tests, than appeared in the first aqueous infusion.† It appears from the twenty-second experiment that a muriatic salt likewise is proven to exist in the tincture by the nitrats of mercury and silver.

The twenty-third experiment naturally leads us to say something on the changes which take place in the precipitates of iron by vegetable astringents. Among those who have treated this subject may be mentioned Macquer

* After observing the intense blackness ensue in the tincture, it occurred to me whether part of it might not be owing to some astringency in the spirits itself, as this is frequently, when first made, put into new oak casks; but upon examination I could not detect any.

† The difficulty of exhausting the virtues of this root is somewhat analogous to that of the cinchona. Dr. Percival, with his indefatigable zeal for science, observes of the latter, that twenty-five coctions, and thirty macerations, were insufficient to exhaust its virtues.

and Monet; they suppose the precipitate to be united with a principle in the gall nut in an oily state. Gianotti, physician at Turin, has made many experiments on iron precipitated from its solutions by vegetable astringents. These inquiries, which are to be found in his analysis of the waters of St. Vincent, show that the precipitate is not attracted by the load-stone; that it becomes attractable by heating it in a well-closed vessel; that it is soluble in acids without effervescence; that these solutions do not become black on the addition of fresh galls; which he thinks shows that the iron is united to the astringent principle, and is in the state of a kind of neutral salt. In the third volume of the Elements of Chemistry of the Academy of Dijon there is a series of experiments on the vegetable astringent principle, which seem to assimilate this substance to acids. Fourcroy observes, " in fact it reddens blue vegetable colours, unites to alkalies, decomposes livers of sulphur, dissolves and appears to neutralize metals, decomposes all metallic solutions with particular phenomena;* rises in distillation without being deprived of its action on metals."

The twenty-third experiment has induced me to conclude that the iron unites with the astringent principle, and is precipitated. I have in this experiment shown that after the black feculent matter is precipitated, the supernatant liquor undergoes no change upon adding to

* That this acid decomposes all metallic solutions is certainly a mistake; platinum, tin, and zinc, are exceptions, with several others. See Thompson's Chemistry.

it more of the chalybeate solution;* but on examination was found to contain sulphuric acid, and a small quantity of iron. Nicholson, in his First Principles of Chemistry, says, " The black fecula is not magnetical; but it is converted into a brown magnetic calx by heat."

The precipitate formed by adding the vegetable and volatile alkalies to vegetable astringents, has by some been considered as the astringent principle. In Keir's Chemical Dictionary a number of observations may be seen relating to this principle. It is there said, when redissolved in water, it blackened a solution of iron but faintly: this is supposed was owing to a small quantity of acid remaining. Dr. Woodhouse supposes that a neutral salt exists ready formed in astringent vegetables, composed of a peculiar acid (gallic acid) and the earth of alum.†

That the astringent principle is in the state of a neutral salt, as Dr. Woodhouse argues, I cannot from the result of my experiments admit. In experiment twenty-third I have shown that the astringent principle was precipitated, and that the supernatant liquor was found to contain sulphuric acid, and a very small quantity of iron, which would not have been the case if the theory advanced by Woodhouse were correct; for the supernatant liquor agreeable to him must be a solution of sulphate of alumine, the gallate of iron being precipitated. That the

* That the black precipitate may be reduced to iron, has, I think, been clearly proven by the experiments of Dr. Woodhouse, on astringent vegetables.

† Vide Inaugural Thesis.

gallate of alumine is astringent, I have no doubt; but that astringency is an undivided principle, confined to a single neutral salt, cannot be admitted. But, on the contrary, every salt of which alumine is the base, is astringent to the taste, together with many others. Limited would it be to confine the bitter principle alone to the sulphate of magnesia; and equally limited must it be to confine the astringent principle alone to the gallate of alumine.

Dr. Thompson supposes the astringent principle not to be a simple acid, the gallic; but this united to a substance lately discovered by the French chemists, called tannin. Dr. Walker, in his dissertation on the Cornus Florida and Sericea, observes, "Though the art of tanning is of ancient date, yet the tannin principle is of modern discovery, with the particular nature of which we are not well acquainted; chemists however suppose it to be a distinct principle in vegetables." The theory of tanning advanced by the ingenious Biggins, that the tannin principle is all that is necessary for that process; and that the gallic acid corrugates the surface, and does not seem to combine with the matter of skin, is very ably refuted by the experiments of Dr. Walker. He found that skins immersed in the tannin principle separately, underwent no more change than if they had been the same length of time in simple water; which proves the tannin (if there be such a principle or substance separate from the gallic acid in astringent vegetables) to be inert of itself.

My experiments warrant me in concluding that there does exist a quantity of gallic acid in a se arate and uncombined state in the different preparations which I have

made, from vegetable blues being changed to a red; and this uncombined gallic acid very much aids in augmenting the astringency of vegetable substances. This I conclude both from the sensible properties, and as manifested by re-agents.

After it has been neutralized by the carbonate of potash, as in experiment twenty-fourth, it looses nearly all its astringent taste; and a precipitate of a yellowish colour takes place, which was dissolved in sulphuric acid. To this solution the solution of sulphate of iron was added, and a purple colour ensued. The ready solubility of this precipitate in sulphuric acid has been adduced as an argument in favour of its being alumine;* alumine is certainly very soluble in sulphuric acid, but if it were a solution of sulphate of alumine, sulphate of iron would not produce a purple colour, as was evident in my experiment.† In experiment twenty-fifth we find the solution of sulphate of iron produced but a very faint purple, and oxy-muriat of mercury a light yellow, with the supernatant liquor of experiment twenty-fourth.

It therefore follows from the two last experiments, that the astringent principle is not precipitated by the addition of alkalies to the infusion, as is observed in Keir's Chemical Dictionary; but that both the precipitate and supernatant liquor evince it by the tests of sulphate of iron, &c.

* Vide Dr Horsefield's Inaugural Dissertation on three native species of rhus.

† The sulphuric acid must be neutralized before the purple colour will take place.

From these experiments, as well as many others which I have made upon this subject, I am convinced we cannot limit astringency to a single uncombined acid, the gallic, or this with an aluminous base; nor to the gallate of tannin as a compound, for they are said to unite together by strong affinity. But that every astringent vegetable contains more or less gallic acid in a separate and uncombined state, which, according to my experiments, has great agency in constituting their astringency. If we saturate the uncombined acid, as in experiment twenty-fourth, the astringent principle is manifested, though in a less degree. This obliges me to conclude, that besides the uncombined acid there exists in astringent vegetables some astringency which must be a compound.

Whether this compound is the gallate of tannin united by strong affinity, I confess I have been unable to determine from my experiments, or to form any accurate idea of the nature of tannin itself.* I should, however, conclude from the experiments and observations of others, that tannin was nothing more than the extract of vegetables, in itself totally inert; and when combined with gallic acid formed the astringent or tanning principle, or compound which I have mentioned above.†

* Davy and Wilkinson say that tannin is precipitated from astringent vegetable infusions by gelatin. But upon adding it to a strong infusion of the root of the Statice Limonium, only a slight turbidness is produced.

† Seguin and Proust, who have particularly mentioned tan as a distinct substance in vegetables, observe, that with the different preparations of iron it strikes a blue colour, and after exposure to the air becomes black; which probably would not take place if it were not combined with gallic acid.

The design of the twenty-sixth experiment was to ascertain whether a cold infusion of the dried leaves contained any gallic acid. From it we learn that none was present by the tests of sulphate of iron and oxy-muriat of mercury. But muriatic acid was shown to be present by the nitrate of mercury and silver causing a white cheesy precipitate; and by evaporating the infusion I obtained regular cubic crystals of muriate of soda, or common sea-salt.

In experiment the twenty-seventh we observe the white curd-like precipitate to evince the existence of muriatic salt in a cold infusion of the central part of the root in rain-water; which must be entirely conclusive that it is a component part of it, and not owing to any adventitious cause.

In the twenty-eighth experiment we perceive the black precipitation produced by sulphate of iron in a cold infusion of the dried root to be immediately re-dissolved or destroyed by the addition of sulphuric acid. This circumstance admits of very easy explanation. The sulphuric acid re-dissolves the iron, and holds it in solution, by which the affinity of the gallic acid is directly counteracted. This is rendered very evident by the black precipitation which immediately ensues when the acid is saturated or neutralized by carbonate of pot-ash. Tartaceous acid is found to prevent the black colour with sulphate of iron in the rhus glabrum, which contains a considerable quantity of it.* Acetous acid likewise has the same effect.†

* Vide Horsefield's Inaugural Thesis.

† Percival's Essays.

The object of the twenty-ninth and thirtieth experiments was to determine, with the nicest precision and accuracy, the relative quantity of gallic acid contained in the cold infusion and tincture of the Statice Limonium, and in galls. The result of these experiments is very obvious, that in the art of dying black this root may be had recourse to as a substitute for the nut-gall.

The thirty-first, thirty-second, and thirty-third experiments were made with a view of ascertaining the probable utility of the Statice Limonium in the preparation of ink. In the thirty-first experiment an ink was made with a cold infusion of the root, nearly equal in point of blackness, and every other property, to our common ink. The result of the thirty-second experiment was much more to my satisfaction; by means of the tincture and sulphate of iron I obtained ink blacker than that in common use. The object of the thirty-third experiment was to determine the relative blackness of the ink of the Statice Limonium, and of galls: from it we perceive that ink made with a similar quantity of galls was not equal in point of blackness to that made with the tincture of the Statice, while between the galls and infusion, as is observed above, there was but very little difference.

On the subject of ink much has been said; and the principles of the formation of it have always been considered a matter of very great importance. Many chemists of the first respectability and reputation have been at different times experimenting on this very useful subject. Among those who have treated this subject with the greatest success, may be mentioned that ingenious and

accurate chemist Dr. Woodhouse. He observes, in his analysis of astringent vegetables, that in the making of ink a double elective attraction takes place; the gallic acid unites with the iron of the green vitriol, while the vitriolic acid unites with the earth of alum. Chaptal says, " It was long since known that iron is precipitated from its solutions by vegetable astringent substances; and the black dyes and the fabrication of ink are founded on this known fact. But it was not till lately that an acid has been proved to exist in these substances which combined with the iron, and which may be obtained from all these astringent vegetables, either by simple distillation, or by digestion in cold water." Lewis, of the Royal Society of London, made many researches on this subject, but was obliged to have recourse to the substances made use of by Chaptal.*

A French gentleman, by the name of Ribaucourt, has made a series of experiments on this subject; but they do not manifest so much simplicity and correctness as those to which I have above referred. He poured a solution of mild vegetable alkali upon a strong decoction of three ounces of galls, which precipitated nine drachms of a grey earth, soluble with effervescence in acids. The supernatant liquor was turbid, but the addition of a small quantity of the alkali threw down a light brown matter, after which the liquor became of a fine clear green. This

* He says, " to make good ink, take one pound of nut-galls, six ounces of gum arabic, and six ounces of green copperas, with four pints of common water."

liquid being evaporated to dryness and calcined, afforded a very white vitriolated tartar by lixivation.

Hence he concludes that the nut-gall, besides the colouring matter, contains three drachms per ounce of calcarious earth, with a portion of vitriolic acid; but that the vitriolic acid not being sufficient to saturate the earth, the remaining portion was originally suspended by the astringent principle or gallic acid. He therefore infers that the calcarious earth of the galls unites with the sulphuric acid of the sulphate of iron, and forms selenite or gypsum; most of which falls down on account of its insolubility in water, while the calx of iron combines with the colouring matter of the galls, and forms the black fecula, which subsides slowly.*

From his experiments he has furnished us with the following valuable receipt for producing an uniformly black and permanent ink. Eight ounces of galls and four of logwood are boiled with twelve pounds of water for an hour, or till one half of its quantity is evaporated. This liquor is then percolated through a hair sieve, and four ounces of vitriol or sulphate of iron, three ounces of gum arabic, one ounce of copperas, or sulphate of copper, and one ounce of sugar-candy are added. The whole mass is stirred to promote the solution of the salts and gum, after which it is left to stand for twenty-four hours. The liquid is then poured off from its coarse sediment, and preserved in well-stopped glass or stone

* Vide Nicholson's Chemical Dictionary.

jars. This ink acquires a beautiful black colour, which it retains for a long time.*

He found logwood to be an useful ingredient, because the colouring matter is disposed to unite with the calx of iron, which renders it not only of a very black colour, but less likely to be changed by the action of acids or the air. Vitriol of copper he found likewise to give strength and firmness to the colour; gum arabic, or other pure gums, was of service in suspending the black fecula, and preventing it from spreading.†

Proust, who has long been known as an accurate and indefatigable observer, has communicated to the National Institute of France, a memoir on several interesting points in chemistry.

Amongst them he examines the combination of the gallic acid and tanning principle with iron forming ink. He observes, first, that the reason why ink is not formed with iron at the minimum of oxydation, as in the green sulphate of iron, is because the tanning principle and gallic acid have less affinity with iron in this state than sulphuric acid has; and that the black colour produced by mixing an infusion of galls with iron, at its maximum of oxydation, arises from the greater attraction of the red oxyde of iron for these principles than for the sulphuric acid. Ink, he therefore considers as a solution of the tannate and gallate of iron in sulphuric acid, analogous to the solution of any metallic salt in a foreign acid;

* Vide Medical and Physical Journal of London, vol. iii.

† Nicholson's Chemical Dictionary.

and for this reason it is that when a plate of iron is put into a solution of ink, this metal precipitates the black particles absolutelv in the same manner as iron separates the phosphate of iron from its solution in acids.*

The theories concerning the formation of ink we perceive to be very different; though this consists in the least important part, all are able to form ink, and all acknowledge that gallic acid, or the colouring principle, is indispensably necessary in its formation. That gallic acid must be present in the formation of ink, I trust no one will deny that experiments upon this subject, or reads the experiments of others who have lately written on it. For my own part, the experiments which I have made are to me entirely conclusive and satisfactory, that the uncombined gallic acid, and the compound unite with the iron of the green vitriol, and form ink when suspended in a fluid by gum arabic. The supernatant fluid after the black fecula is formed and precipitated, I am convinced, from experiment twenty-third, contains a very small quantity of sulphuric acid and iron. This sulphuric acid no doubt is produced by the decomposition of the vitriol, and precipitation of the iron with the gallic acid and the compound. It may be asked, Why does not this uncombined sulphuric acid destroy the black colour, as I have proven acids do in an experiment? My answer is, that the quantity is too small.

This theory points out the necessity of having sulphate of iron nicely saturated or neutralized in the formation of

* See Annals of Philosophy for the year 1809.

ink; and the impropriety of making use of vinegar as a menstruum, as recommeded by Lewis.*

It has been supposed that the defects of ink arise chiefly from a want of colouring matter.† The theory established on the facts discovered by Ribaucourt requires that none of the principles should be in excess. Certain it is, if there be a want of the gallic acid, part of the sulphate of iron will not be decomposed; or, on the contrary, if there be too much, the sulphate of iron will take as much as it can decompose, and the residue will remain in its original state of infusion, subject to the change of becoming mouldy, &c.

From the result of my experiments upon the root of the Statice Limonium in the preparation of ink, I feel a confidence in recommending it as a valuable substitute for the nut-gall. I have shown that with the tincture of this root, an ink may be made superior in blackness to that in common use; and with which the whole MS. of this Thesis has been written. My object at present is not to bestow extravagant or false encomiums on this root, but only to encourage the investigation of our own indigenous vegetables, by which we may lessen the necessity of importing galls. When the lofty oaks of our forests are consumed, perhaps the Statice Limonium will be resorted to as a substitute.

A very important practical inference may be deduced from experiment thirty-fourth, with regard to the com-

* Vide Lewis's Philosophical Commerce of Arts.

† Ibid.

parative astringency of the dried and green roots. By this experiment it appears from repeated trials, that the green root contains but very little of the astringent principle when compared with the dried root. May not this difference be accounted for by supposing the base of the gallic acid to be more oxygenated in the dried than in the green roots? And may not the affinity of the base of gallic acid for oxygen be increased by drying the root with a considerable degree of artificial heat?

After burning a quantity of the dried root and lixivating the ashes in experiment thirty-fifth, we find the lixivium to contain an uncombined alkali and muriatic salt, which was mentioned in several of the preceding experiments. Not knowing the species of uncombined alkali, I took a quantity of the lixivium, and added to it a solution of tartareous acid in water. No precipitate ensuing, I concluded the species of alkali must be the mineral or soda; for if it were the vegetable alkali, it would have been precipitated in the form of tartrite of pot-ash or cremor tartar.

To ascertain the base of the muriatic salt contained in the lixivium, I took a quantity of it, and by evaporation obtained a regular arrangement of cubic crystals of muriate of soda or common sea-salt. From this experiment therefore it appears, that the root contains mineral alkali or soda, and muriate of soda or common sea-salt.

ON THE USE OF THE

STATICE LIMONIUM IN MEDICINE.

IN DYSENTERY.

The indiscriminate use of this root in dysentery, as is common among those who are totally unacquainted with the nature of this disease, must certainly not always be attended with happy or salutary consequences. As a domestic remedy in this disease, the Statice has been long known. No doubt sometimes it has been made use of, accidentally, in that stage, when it was most proper, and has been followed by a cure. This has caused it to be used as it is at present in every case, without any regard to stages or symptoms.

Dr. Thomas Clark, in his observations on the diseases of the West and East-Indies, and of America, says, "In my opinion this disease may be very well accounted for, from the general relaxation that takes place in warm climates, and in temperate ones at certain seasons." Without entering particularly into the inquiry concerning the nature of this disease, let it be deemed sufficient barely to mention the period or stage when this root may be given with most advantage, or when it ought only to be given. After the tormina and tenesmus are removed, the intestinal canal frequently remains in a very torpid, or inactive, or relaxed state for a considerable length of

time. In this chronic stage of dysentery, or, as it is very properly and scientifically denominated by the illustrious Dr. Rush, dysentericula, there is no remedy perhaps which, from experience, we can better rely on for its removal than this. But until evacuations have been premised, and the inflammatory diathesis, griping, and tenesmus are removed, this root, if given, will only tend to aggravate all the symptoms.

After the Quassia Simarouba, the different preparations of the Mimosa Catechu, and the formerly very much celebrated Theriaca Andromachi, and other astringents have been used for a long time, without any benefit, by having recourse to a decoction of this root, by boiling two drachms in ten ounces of water to eight, patients have been very soon restored to health. Perhaps the superior advantage of this root is owing to the muriate of soda, which, from analysis, it is found to contain in a considerable quantity along with the astringent principle; the salt, by stimulating the stomach and intestines increases digestion in the former, and promotes a more copious absorption of chyle from the latter, by increasing the action of the mouths of the lacteals. That the introduction of muriate of soda into the stomach is productive of benefit we are induced to believe from the frequent success which has followed the use of salted fish and meats of various kinds in desperate cases of this disease. As we have in this root both the astringent principle and the muriate of soda, happily calculated for the removal of this complaint, it is justly entitled to attention, and certainly deserves a conspicuous place in the Materia Medica.

IN DIARRHŒA.

As this disease consists, as Dr. Cullen very justly observes, "In the stools being more frequent and liquid than natural, without any griping or fever," this root certainly from theory would be brought in as an active article in its cure. And from repeated instances of its successful exhibition both in the New-York Hospital and in private practice in this disease, and particularly in the diarrhœa infantum, I feel no hesitation in recommending its general use. In Dr. Darwin's Zoonomia we find mentioned a species of diarrhœa by the name of Diarrhœa Frigida. He says of it, "But this disease is sometimes of a dangerous nature, the intestinal absorption being so impaired, that the aliment is said to come away undiminished in quantity, and almost unchanged by the powers of digestion, and is then called lientery." In conjunction with the remedies he has mentioned for its removal, I think the Statice Limonium may with the greatest propriety be added.

IN CHOLERA.

In this disease I am informed by a very respectable physician of this city, a decoction of this root is attended with very good success, insomuch that he has been almost upon the verge of denominating it a specific, particularly in the cholera infantum. And from a number of trials of it in this disease which I have witnessed, I think I can

with justness say, that it equals any thing that can be given; and it appears to agree better with the stomach than the cretaceous or absorbent mixtures which are usually given.

IN HÆMOPTYSIS.

Dr. Rush first gave publicity to the use of muriate of soda or common sea-salt in this disease. He found it to succeed equally well in hemorrhages, whether they were of the active or passive kind, or whether they occured in young or old people. He observes, "The mode of giving it is to pour down from a tea to a table-spoonful of clean fine salt as soon as possible after the hemorrhage begins from the lungs. This quantity generally stops it; but the dose must be repeated daily for three or four days, to prevent a return of the disorder. If the bleeding continues, the salt must be continued till it is checked, but in larger doses. I have heard of several instances in which two table-spoonfuls were taken at one time for several days."* As from analysis we have found this root to contain a good deal of muriate of soda in conjunction with the astringent principle, from analogy we would recommend it to be used in this disease; and not only from the muriate of soda which it contains, but likewise the astringent principle. Formerly astringents were almost the only remedies used in this disease; and at present they are considered by some as being very efficacious,

* Vide Rush's Inquiries and Observations, vol. i.

particularly alum. Therefore, by using this root we have the advantage of two very celebrated remedies.

IN HEMORRHOIS.

Whenever the hemorrhoidal flux is in excess, astringents, both externally and internally, are very useful and proper. Dr. Cullen says, " In all cases, therefore, of excess, or any approach towards it, and particularly when the disease depends upon a prolapsus ani, I am of opinion that astringents, both internal and external, may be safely and properly employed; not indeed to induce an immediate and total suppression, but to moderate the hemorrhagy, and by degrees to suppress it altogether, while, at the same time, measures are taken for removing the necessity of its recurrence."* As galls are frequently used with the best success in this disease, I am guided by analogy when I recommend a vegetable which, according to my experiments, possesses nearly as much astringency.

From analogy I would likewise recommend this root in leucorrhea, gleet, menorrhagia, and hematemesis.

Before I bid adieu to the University in which I have been educated, I must, in justice to my own feelings, return my most sincere thanks to its several medical professors. From you, gentlemen, individually, I have

* Cullen's First Lines.

received a portion of that store of medical knowledge which now enables me to obtain the highest honours of this University. I feel towards you the same emotions that a dutiful son does to a beloved parent. You have, I trust, in full confidence, conducted the little bark through the boisterous and tempestuous ocean of pupilage, to the safe and desired haven. That you may with indefatigable zeal disseminate the healing art far and wide through this western hemisphere, and establish in this seminary the Leyden of the West, is my most fervent wish. And may the latest posterity recognize your labours with the warmest gratitude and esteem, long—long after you have bidden adieu to all sublunary things.

Nec veró terræ ferre omnes omnia possunt.
Fluminibus salices, crassisque paludibus alni
Nascuntur: sterilis saxosis montibus orni.
Litora myrtetis lætissima: denique apertos
Bacchus amat colles: Aquilonem et frigora taxi.

VIRG. G. ii. 109.

Nor every plant on every soil will grow;
The sallow loves the wat'ry ground, and low;
The marshes, alders; nature seems t' ordain
The rocky cliff for the wild ash's reign;
The baleful yew to northern blasts assigns;
To shores the myrtles, and to mounts the vines.

THE END.